with associated physical table structures. Dynamic segmentation attributes are attributes that are defined for only a sub-section of a linear Entity; in TSAF, these attributes only apply to Division Section and road Section Entities. For example, pavement type 1331 is a dynamic segmentation attribute of a Division Section. Entity attributes are attributes that apply to an entire Entity. For example, the county name is an Entity attribute of a county Entity.

**[0100]** 3. **The Map Data Model.** The ability to generate and display maps, in addition to tabular data is an advantage of the system and method. This is provided by the Map Data Model. In the exemplary embodiment, this functionality is provided through the use of (a) the ESRI SDE middle-ware, which allows a column of spatial data to be added to an Oracle® table, and (b) the ESRI Map Objects software that facilitates generation of maps based on Oracle® SDE tables. This basic functionality is augmented with tools for (a) generating map layers that display faster than Division Section based map layers and (b) automating the maintenance process for the maps. For example, if the speed limit for a section of road is altered, then every map layer that relies on the altered speed limit data must be modified. This could include multiple speed limit maps that are appropriate at different zoom levels, as well as other maps that combine speed limit data with other data (e.g., a speed limit in school zones map).

**[0101]** 4. **The Query Model.** The ability to generate relational queries that report on the data is an additional advantage of the system. This is provided by

the Query Model. Most data is stored in Oracle® tables with location information represented by dynamic segmentation tables related to the Division Sections. One advantage of this representation is that users can perform queries of this data, including some queries that are spatial in nature, using purely relational query tools. This results in much broader access to data throughout the user community and much faster response time when performing queries. One disadvantage of this representation is that the SQL statements necessary to perform these queries can be complicated.

**[0102]** 5. **The Location Referencing Model.** The data model uses dynamic segmentation to identify the location of most road-related data. For data that is tied to road-divisions, dynamic segmentation tables that are related to Division Sections are used. For data that is tied to the entire road, dynamic segmentation tables that are related to Road Sections are used. This internal representation (based on Anchor or Road Section ID and percentage offset) is typically not appropriate for user interactions.

**[0103]** The fundamental location referencing method for users of the exemplary system is RCLink and milepoints along that RCLink. The Road-Division Data Model also defines Mileposts, which establish a second location referencing method based on RCLink name and mileposts.

**[0104]** Other location referencing methods in addition to those supported directly by the Road-Division Data Model are provided. Street names are supported through the use of the traversal Entity class type. RCLinks are simply a

system-required implementation of a Traversal. Street addresses are supported through address tables.

**[0105]** 6. **The Data Maintenance Model.** The data is not static, but is updated continuously by different organizations within the user community. This is done by the Data Maintenance Model. A number of factors make the data maintenance process complicated. For example, historical values must be maintained for most data, and maps are derived from both the current and historical values. The data maintenance process must automatically maintain both the historical values and any associated maps whenever data changes. Also, user work practices may not ensure synchronized updates to the data (e.g., the road collection bureau may collect information about a road before that road has been mapped). The data maintenance process must prevent data corruption that could result from such unsynchronized updates.

**[0106]** 7. **The Data Dictionary Model.** One of the goals of the system and method is to build a database that is extensible, so that new data can be added to the databases with reduced reprogramming. To meet this goal, a Data Dictionary is included as part of the Data Dictionary Model, which maintains meta-data about the data. For example, the Data Dictionary maintains the definitions of map layers so that the data maintenance routines can determine the map layers that could be affected by a data change. Because the meta-data that defines data elements is contained in a Data Dictionary rather than in